the parallel ridges being spaced so that said microparticles in said planar cavity form rows between the parallel ridges.

Please add claims 8-29 as follows:

--8. A flow chamber, comprising:

an inlet at one end of said flow chamber;

an outlet at another end of said flow chamber;

a planar cavity in fluid communication with each of said inlet and outlet, wherein said planar cavity holds a closely packed planar array of microparticles, each having an analyte anchored thereto, during a sequence of processing steps such that processing reagents can access each microparticle during each step of a process.

9. The flow chamber of claim 8, wherein closely packed with reference to the planar array of microparticles requires either that the number of microparticles per unit area in the planar array is at least eighty percent of the number of microparticles in a hexagonal array of equal area or that the average distance between between centers of adjacent microparticles is less than two microparticle diameters.

10. The flow chamber of claim 8, wherein the planar comprises an optically transmissive ceiling and a floor, the optically transmissive ceiling and the floor being substantially parallel to one another and the floor having a plurality of parallel ridges disposed parallel to a longitudinal axis of the flow chamber and spaced so that the microparticles in the planar cavity form rows between the parallel ridges.

11. A detection apparatus for detecting a sequence of optical signals from each of a plurality of microparticles, comprising:

an optical train for collecting and converting the optical signals from the microparticles into digital signals;

an imaging device for recording a plurality of digital images of the microparticles; and

signal tracking means for correlating the optical signals from each of the microparticles in each of the digital images of

the optical signals to form for each microparticle a sequence of optical signals.

12. A device-readable medium embodying a program of instructions for execution by said device to perform a method of generating images of a planar array of microparticles to track positions of the microparticles during a sequence of processing steps, said program of instructions comprising instructions for:

rendering a plurality of digital images of the planar array of the microparticles during the sequence of processing steps based on optical signals generated at the microparticles; and

processing the plurality of digital images including correlating optical signals generated at each microparticle with its corresponding image in each of the plurality of digital images to track each microparticle during the sequence of processing steps.

13. The device-readable medium of claim 12, wherein said processing further includes recording at least one optical characteristic of each microparticle to determine the approximate center of each microparticle.

14. The device-readable medium of claim 13, wherein said processing further includes assigning a plurality of pixels to each microparticle for determining at least one property of the optical signals generated at each microparticle.

15. The device-readable medium of claim 14, wherein the number of pixels assigned to a given microparticle is determined based on at least one of:

(i) the degree to which the approximated center of the given microparticle is likely to deviate from the geometric center;

(ii) the size of the given microparticle; and

(iii) the uniformity of the diameter and shape of the given microparticle.

16. The device-readable medium of claim 14, wherein an initial pixel of the plurality of pixels is assigned to each microparticle which encloses the approximated center of that microparticle.

17. The device-readable medium of claim 16, wherein, after the initial pixel is assigned additional pixels, immediately adjacent the initial pixel, are assigned to each microparticle.

~~18.~~ A method of generating images of a planar array of microparticles to track positions of the microparticles during a sequence of processing steps, said method comprising the steps of:

rendering a plurality of digital images of the planar array of the microparticles during the sequence of processing steps based on optical signals generated at the microparticles; and

processing the plurality of digital images including correlating optical signals generated at each microparticle with its corresponding image in each of the plurality of digital images to track each microparticle during the sequence of processing steps.

19. The method of claim 18, wherein said processing further includes recording at least one optical characteristic of each microparticle to determine the approximate center of each microparticle.

20. The method of claim 19, wherein said processing further includes assigning a plurality of pixels to each microparticle for determining at least one property of the optical signals generated at each microparticle.

21. The method of claim 20, wherein the number of pixels assigned to a given microparticle is determined based on at least one of:

(i) the degree to which the approximated center of the given microparticle is likely to deviate from the geometric center;

(ii) the size of the given microparticle; and

(iii)the uniformity of the diameter and shape of the given microparticle.

22. The method of claim 20, wherein an initial pixel of the plurality of pixels is assigned to each microparticle which encloses the approximated center of that microparticle.

23. The method of claim 22, wherein, after the initial pixel is assigned additional pixels, immediately adjacent the initial pixel, are assigned to each microparticle.

24. An array of polynuceotides, comprising:
a closely packed planar array of microparticles; and
a plurality of different polynucleotides attached to each of the microparticles such that each different polynucleotide is attached to a different microparticle.

25. The array of claim 24, wherein closely packed with reference to the planar array of microparticles requires either that the number of microparticles per unit area in the planar array is at least eighty percent of the number of microparticles in a hexagonal array of equal area or that the average distance between between centers of adjacent microparticles is less than two microparticle diameters.

26. The array of claim 24, wherein the diameter of each of the microparticles is between about 0.1 μm and 100 μm.

27. The array of claim 24, wherein the plurality of different polynucleotides comprises a cDNA library.

28. The array of claim 24, wherein the planar array of microparticles is disposed in a flow chamber.

29. The apparatus of claim 2, wherein said planar cavity of said flow chamber further has a optically transmissive ceiling and a floor, the optically transmissive ceiling and the floor being parallel to one another and the floor having a plurality of parallel ridges, the parallel ridges being disposed parallel to said axis of said flow chamber, and the parallel ridges being spaced so that said microparticles in said planar cavity form rows between the parallel ridges.--